

REMARKS

Claims 1-6, 8, 10-13 and 15-22 are pending. By this Amendment, claim 8 is amended.

Reconsideration based on the following remarks is respectfully requested.

The attached Appendix includes a marked-up copy of the rewritten claim (37 C.F.R. §1.121(c)(1)(ii)).

I. The Claims Define Patentable Subject Matter

The Office Action rejects claims 1-6 and 8 under 35 U.S.C. §102(a) over Ishida et al. (U.S. Patent No. 4,035,673). This rejection is respectfully traversed.

Ishida et al. does not disclose or suggest a piezo-electric resonator including, inter alia, a base having an opening formed therein which allows the internal atmosphere to communicate with an atmosphere external to the housing, as recite in claim 8.

The Office Action states that it is assumed that the glass cover is hermetically sealed after sealing the upper and lower halves to allow removal of contaminants in a known manner. However, column 6, lines 44-52 of Ishida et al. indicate that frequency adjustments are made after the opening is hermetically sealed. Thus, the opening does not allow the internal atmosphere to communicate with an atmosphere external to the housing.

Thus, Ishida et al. does not disclose or suggest the piezo-electric resonator of claim 8.

The Office Action also rejects claims 1-6, 8, 10-13 and 15-22 under 35 U.S.C. §103(a) over Ishida et al. in view of Fisher et al. (U.S. Patent No. 2,824,219), Staudte (U.S. Patent No. 3,969,640) or Kobayashi et al. (U.S. Patent No. 4,293,986). This rejection is respectfully traversed.

Neither Fisher et al., Staudte, nor Kobayashi et al. make up for the deficiencies of Ishida et al.

Fig. 1 of Staudte discloses a plug 39 that covers a hole 40 in a cover 37. However, the hole is not disposed at a position of the base opposite to a frequency adjusted area of at least one of the resonating arms, as recited in claim 8.

Fisher does not disclose or suggest a piezo-electric resonator being a tuning fork type resonator element having a base portion and two resonating arms elongated from the base portion, the base portion mounted on the base at the side of the base portion from which the resonating arms are not elongated, and the opening in the base being formed at a position of the base opposite to a frequency adjusted area of at least one of the resonating arms as recited in claim 8.

Instead, Fisher discloses a circular disk like quartz plate mounted at both sides of the quartz plate. Further, Fisher discloses an opening for frequency adjustment formed at the position of a housing opposite to a center of the quartz plate. Because the mounting portions in Fisher are positioned near the opening, the thermal stress due to sealing the opening by soldering affects the mounting portions, which in turn causes deterioration such as frequency variation of the quartz plate. In contrast, the claimed invention provides an opening far from the mounting portion. Thus, the thermal stress due to sealing the opening does not effect the mounting portion. As a result, the deterioration such as frequency variation of the piezo-electric resonator is suppressed.

Kobayashi et al. also does not disclose the above features. Instead, Fig. 7 of Kobayashi et al. discloses an opening positioned near the mounting portion of a quartz crystal vibrator leaf. Thus, the thermal stress due to sealing the opening by a chip of soft metal affects the mounting portion in Kobayashi et al. As discussed above, this causes deterioration such as frequency variation of the quartz crystal vibrator leaf.

For at least these reasons, it is respectfully submitted that claim 8 is patentable over the applied references. The dependent claims are likewise patentable over the applied

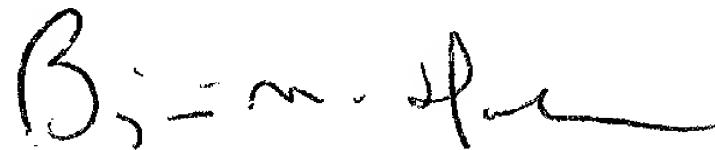
references for at least the reasons discussed as well as for the additional features they recite. Applicants respectfully request that the rejections under 35 U.S.C. §102 and §103 be withdrawn.

II. Conclusion

In view of the foregoing, Applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance are earnestly solicited.

Should the Examiner believe anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,



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Attachment:  
Appendix

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